

President's Report



Two Challenges to Negative Prophecy:
"Clinical Applications Units"
and
"The Cloister Project"



TWO CHALLENGES TO NEGATIVE PROPHECY:

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By

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PRESIDENT'S REPORT

THE SUMMER issue of *The American Scholar* contains a thoughtful article entitled "*The End of the Physician-Scientist?*"¹ The author, Gordon Gill, predicts that in America — as he says happened in England and on the European continent ten years ago — a schism between basic science and clinical medicine will soon be complete. The gist of his message is that the clinician-scientist is now the "clinician-applier of basic science" and is not likely to keep pace, much less surpass the basic research specialist. By Dr. Gill's reckoning, the revolution in biology has bypassed the medical profession, and the academic practitioners will have to be content with simply improving the quality of care.

The dizzying acceleration of molecular biology is thus viewed as threatening the extinction of a never-too-abundant species: those physicians who have managed to be both prime movers in solving fundamental problems in the laboratories and pioneers in applying what they learned on the hospital ward. Especially from the early 1950s to the '70s, the intramural program of the National Institutes of Health was a rich breeding ground of such hybrids, and their migrations to and fro between Bethesda and Academe transformed medical education. Today it would appear that Cal Tech and MIT and Cold Spring Harbor are the preserves of the new biology and that physicians who winter there may never return to the clinic.

There is legitimate concern here — one of profound importance to many, including the Howard Hughes Medical Institute.

The HHMI was chartered to promote "human knowledge within the field of the basic sciences (principally the field of medical research and education) and the effective application thereof for the benefit of mankind." From the outset the organization has interpreted this as a mandate to embrace the full continuum from fundamental inquiry to clinical application. This purpose has been pursued according to three principles: an unrelenting search for excellence, a determination to complement and not merely duplicate the methods of similar organizations, and a willingness to run counter to prevailing trends if long-range projections of need and opportunity appear to merit the risks. It is in this context that one should give thought to the sobering prophecy above.

All of us who work in the worlds of medicine and science understand the possibly grave consequences of a break in the connection between those worlds. If the academic physicians should no longer be able to cope with the frontiers of biology, what kinds of 'visits' are going to be leading the troops from bed to bed in the medical centers of the future? Who will be the clinical interpreters of the new technologies for cloning and sequencing, measuring genetic polymorphism, or controlling embryonic development? Who will be the advocates for the patient or the learned counsels for society?

Such questions translate into precepts for the imminent future. Science's inventions must continue to be transformed into efficient means for alleviating ill health. The awesome power of biological manipulation must be competently and wisely exercised. And humaneness must guide application.

In sum, if the lights dim that have traditionally given the students their headings as they move out into the practice of medicine, how will they cope with the scientific innovations ahead?

It would appear that the prevailing mood about this looming problem is running toward the negative. We propose at least two countermeasures.

"CLINICAL APPLICATIONS UNITS"

ALTHOUGH the quickened pace of scientific discovery does present a formidable demand upon medical scientists in general, it is a desirable reality rather than the issue here. But a real and major problem is the increasing distraction of the clinical investigator by certain features of the present system of academic science and medicine. There is incessant and ever-mounting pressure to engage in practice and contribute to faculty income, in turn needed to support the school. A second demand arises from the emphasis in federal research funding upon short-term awards for investigator-initiated projects. The selection of such projects by peer review conducted along disciplinary lines is a most admirable method and needs no defense. It can be deadly, however, to the professor of medicine who must compete within today's narrow range of priority scores against others who are not burdened by the ward rounds and clinical teaching that are vital to the clinician-scientist's role.

The answer does not lie in freeing clinicians from the wards and clinics. Nor can it be found in radical changes in the NIH processes for making awards. Block support to institutions for research by faculty is not a practical alternative, and study panels cannot and should not be persuaded to veer from their traditional orientation to the proposal rather than the proposer.

The situation is a natural opportunity and a worthy challenge to HHMI, which has resources and flexibility matched by few other organizations.

Ways have to be found to keep the bridges open between the basic and the clinical sciences. We believe one formula is the placement of HHMI laboratory units in appropriate affiliate institutions. These units would have the following attributes:

Each would be headed by a clinician-scientist capable of both directing fundamental research in the laboratory and leading clinical investigations. He or she should be highly experienced and demonstrably productive. The unit should have several basic themes, including clinical application of one of the new paradigms in science, such as exploration of basic problems in molecular genetics and movement of emerging techniques toward effective medical interventions.

In each unit would be several junior scientists ranging from 'pure' molecular biologists to investigative physicians. Some might have independent budgets, some not; but all should be amenable to benefit from interaction with the senior investigator and the rich mix of talents that such units must be prepared to maintain.

Opportunities should be provided for early postdoctoral candidates, including recent M.D.-Ph.D. graduates reentering research from subspecialty training. Predoctoral candidates of various kinds, including medical students, should also be engaged.

The funding of the group should include stable, long-range commitment for the senior investigator, for the junior but established colleagues, and for their core support. The amounts and renewals should be subject to periodic review. Some of the activities may be supported by grants from external agencies, particularly for the younger staff members on more limited appointments.

The setting of such a unit or units must be in conjunction with an academic hospital, which will usually have an NIH-supported clinical research center accessible to the HHMI unit, obviating the need for routine support of beds or clinical care. Several kinds of projects, not otherwise likely to be funded, might be undertaken:

- ◇ certain worthy clinical experiments of high (scientific) risk and unusual cost;
- ◇ studies of interventions in field or clinic, with long-range observation of effects; and
- ◇ tutorial exercises promoting understanding of the social and ethical aspects of molecular biology as applied in medicine — activities that should include participants with different points of view.

One to several units would be co-operative within the affiliated institution. Each might have from 4,000 to 10,000 square feet of space, and would share service facilities and personnel. The chiefs of the units would form, together with the chairmen of appropriate clinical and perhaps basic science departments, a directorate capable of assisting in recruitment and maintaining a productive milieu and effective interactions. Maximum integration of the unit into the full academic life of the affiliated institution is imperative, though limitations on the time spent in faculty administrative activities (common to all HHMI units) would be important in assuring high productivity.

Unit members, including very junior staff, should have opportunities for training and experience in remote basic or clinical settings to enhance their contribution upon returning to the parent unit.

In July 1984, agreement was reached to create an "HHMI Laboratory for Clinical Applications of Molecular Genetics" in Ann Arbor affiliated with the University of Michigan Medical School and its university hospital. The first 17,000 square feet of space will be ready for occupancy by January 1986, and additional contiguous space up to twice that amount will be available a year later. Recruitment of senior clinical investigators is under way.

"THE CLOISTER PROJECT"

FEARS OF EXTINCTION of the properly trained clinician-scientist have been fueled by several indices in the last few years. A decrease is perceived in the numbers of medical school graduates choosing full-time careers in research. There has also been a decline in the proportion of M.D.'s among those participating in NIH training programs and among principal investigators on NIH research grants. To the social and economic factors believed to underlie these trends must be added the progressive lengthening of the period of preparation for a career in biomedical science as the search for knowledge moves to the molecular level.

Paradoxically, the growth of medical knowledge is also displacing research experience from the medical curriculum. Most students now graduate without a taste of the gratifications of scientific inquiry, or an opportunity to benefit from such experience in the practice of their profession.

Research training that begins only after the years of clinical residency is often too little to produce an investigator who can compete successfully or too late to attract trained physicians from more remunerative career alternatives.

Despite anxiety about the increasing competitiveness and thus the narrowing of opportunities for a career in research, a desire for early scientific experience remains strong among many medical students today. It is a common faculty impression that the number of students interested in taking time out to gain such experience is again increasing. Fellowship programs to make this possible — the Dana Foundation Clinical Research Training Program and the American Heart Association Medical Research Fellowship Program, to mention but two — have recently materialized and are already oversubscribed.

There are some generally accepted conclusions about such opportunities for student research. The period of engagement ought to be sufficient to get a good start in techniques and perhaps to see some aspect through. Six months is barely enough; clearly a year is better. The best time to begin is probably at the end of the second year of medical school, though aptitude and opportunity will vary. A decent wage should be provided, for many students have dependents and some are already heavily in debt for their education.

Other conditions of a broader nature should be met. The experience should be conducted in an atmosphere of excellence, where scholastic discipline and the critical faculty are deeply ingrained, and where the collegiality of peers amplifies encounter with the scientific method and its practitioners. Thus should be instilled the ideal of the scholarly community.

Another major need is for continuity of experience — provision for followup that will sustain the first quantum leap in interest and excitement about research. As the graduates of the NIH Medical Scientist Program (affording M.D.-Ph.D. training) can witness, the reentry into scientific competition, after a long interruption for residency training, can be difficult. The specialty boards are at long last beginning to soften their once rigid requirements for uninterrupted clinical training. Moreover, an isolated research experience as a student cannot sustain an ambition to become a scientist. The medical schools should encourage continual exposure to the laboratory for that important minority of students bound for a research career.

The HHMI and NIH have this month concluded that it will be to their mutual advantage to foster cooperation between their intramural research operations. One feature will be a unique program to offer students an extended period of research training in NIH laboratories. This will include residence on the NIH campus and opportunities to continue the research experience upon return to school.

The focus for this program will be facilities provided on NIH grounds by renovation and construction at the Mary Woodard Lasker Center for Health Research and Education, recently acquired near the Clinical Center and other NIH facilities at Bethesda. To the venerable convent once inhabited by the



Proposed structure at the Mary Woodard Lasker Center for Health Research and Education.

cloistered Sisters of the Visitation will be added a residence for the “Hughes Research Scholars.” Also to be created are new lecture halls, classrooms, commons rooms, and a teaching laboratory for use of the students and the entire NIH community.

Initially at least, the recruits will be medical students, entering usually after their second year. The class will begin in 1985 with about ten trainees and will grow to an annual total of thirty. Announcements will soon appear informing students in all of the nation’s medical schools how to apply. The program will be overseen by a committee of NIH and HHMI scientists, and the students will spend their first year in NIH laboratories. HHMI scientists will cooperate in recruitment, counseling, seminars and didactic exercises, and can play an especially valuable role in helping the students maintain research activities upon return to their home institutions.

Estimated costs to HHMI for creation of facilities and operating expenses of the program during its first five years will be about \$10 million. It is anticipated that the HHMI-NIH cooperation will be a long-lasting one. Surely this public-private partnership in training for research careers should prove to be an important bridge for sustaining the essential connection between basic research and clinical application.

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¹Gordon N. Gill, The End of the Physician-Scientist? *The American Scholar*, 53:353-368, Summer 1984.